WiseNews Database for Primary Four Inquiry-based Learning Projects.

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Abstract:

Education Bureau (EDB) made inquiry-based learning as one of the emphases under the new General Studies curriculum for the local primary schools. This paper reports on a study that examines the use of WiseNews, a Chinese news database, by primary 4 students who conducted two inquiry-based learning projects with each lasts from 2-3 months. With guidance from the General Studies teachers, students chose their own topics under a general theme – the environment and the history of Hong Kong or China.

Various kinds of information-seeking behaviors of the students, including browsing, searching, viewing, email, print and download, were recorded automatically by WiseNews. To further understand the students' use of the database, a survey was administered with all students and teachers. Some students and teachers were also interviewed concerning their opinions on WiseNews. The researchers observed how some students actually used the database.

Totally 4233 (for project 1) and 302 (for project 2) information-seeking activities using WiseNews were performed by the students. The major means of seeking information by the students was searching (81.3% in project 1 and 87.1% in project 2) and browsing (18.7% in project 1 and 12.9% in project 2). Among others, this paper will discuss reasons for the differences between students' levels of search activities in the two projects and the differences between their two modes of searching. By analyzing data from WiseNews and from survey, interview, and observation, this paper will draw a conclusion as to applicability of WiseNews for upper primary students.

Keywords: online database, inquiry-based learning, General Studies, knowledge cultivation, information literacy.

1.   Introduction

The Education Bureau has put inquiry-based learning (IBL) as one of the first emphases under the new General Studies curriculum for primary schools with the objective of "creating more learning space by removing obsolete content, allowing more time for inquiry-based learning" (Education Bureau, 2007). In the past, school libraries do not exist in many Hong Kong primary schools. In this mode of learning, students are encouraged to conduct their own investigations

with an open mind, and try to connect the knowledge acquired in school to daily life. To study how to effectively incorporate IBL into the General Studies classroom a two phase study in local primary school was conducted. Each phase, students were given 9 to 10 weeks to present a topic of their choice that matched the theme that was being taught in that phase. Some of the topics that the students came up with are: the effects of water pollutions on daily life; the effects of air pollution on health; global warming; and deforestation.

Although in each phase students were allowed to use whatever resources they wanted, the WiseNews database was provided for them because it draws from a myriad of sources such as newspapers, magazines, journals and newswires dating back to 1998. In addition, it is updated every day with content direct from nearly 1000 content providers and 500-plus top tier websites. Many of these articles are not freely available on the Internet, while others may no longer available on the web. Because of this vast wealth of information it would be an ideal resource for General Studies' projects.

This study looks at the usefulness of an online database like WiseNews in helping students collect information for their IBL projects?

2. Literature review

Under the new General Studies curriculum for local primary schools, the Education Bureau has put inquiry-based learning as one of the first emphases with the objective of "creating more learning space by removing obsolete content, allowing more time for inquiry-based learning" (Education Bureau, 2007).

Inquiry-based learning involves self-directed inquisition of knowledge on the student's part, which is closely related to the learning behavior of children using resources such as the World Wide Web or their utilization of search engines to find information. Looking at Yahooligans, a Web directory and search engine for children as an example, Bilal (2002) investigates fact finding, research-oriented and fully self-generated search tasks and collects data on children's information-seeking behavior from the cognitive, affective and physical perspectives using qualitative and quantitative inquiry methods. The information-seeking behavior of students is believed to be different from adults. According to Bilal (2002), young students may encounter problems in understanding research processes, selecting effective search terms, and they often

lack of sophistication in language manipulation and search strategy formulation (Large, Beheshti & Breuleux, 1998; cited in Large & Beheshti, 2000). Also, it was found that Yahooligans had a poor web layout which negatively affected children's search performance. It suggested that a system needs to support children according to their information seeking behavior. In addition, they need to undergo effective web training to learn successfully.

Research on children's use of the World Wide Web has revealed that children do not tend to question the information they find. Hirsh (1999) studied young students' information seeking behavior for electronic resources. It was found that topicality is the main relevance criterion the children use to evaluate the usefulness of textual materials. Reuter & Druin's study (2004) on children's interaction with the Digital Library software found that in young students' searching and selection, there is a high convergence in their search terms used. In Bilal's earlier (1998) study, children make persistent attempts to find the information they needed through Yahooligans, but were unsuccessful in finding information for the research question as well as locating the correct answer for factual questions. Children's information seeking behavior were captured by Lotus ScreenCam in Bilal's (2000 & 2002) study, a software that records, saves and replays activities in Web browsers. It was found that children employ both searching and browsing methods to complete a goal-oriented task that required finding a specific answer to query. As information seekers, most (64%) children adopt the keyword searching approach over browsing and use the most concrete concept from the search query. In comparison, children who adopt browsing (36%) select the category and subcategories they find appropriate. The results may have been influenced by the query itself (fact-driven query), the interface design, and children's problem-solving style. With effect of the curriculum change, it has implications for developers to design a user-centered interface that would better aid children's learning in accommodation for their unique information seeking behaviours. Furthermore, Bilal points out the important roles of school librarians and teachers to provide effective information access skills training by diagnosing students' critical thinking and search processes prior to Web use.

In this study, the use of WiseNews in IBL projects is emphasized. While precedent studies mainly look at North American children, this investigation looks at Chinese children to explore learning patterns that could hopefully shed light on local curriculum reform and implementations. It has, significantly, established inquiry learning in an original rote learning setting. It is possible

for future studies to compare the facilitation of inquiry-based learning in different "bands" of schools to make adjustments according to students' needs.

3. Research methods

The research investigated four classes of primary 4 students of a local school. The total number of students participated was 141 and about 30-40 students per class.

The study was conducted in two phases. Students were divided in groups and were asked to do a project in each phase. Phase 1 lasted from 27th November 2006 to 9th February 2007 (10 weeks excluding holidays). A theme "The Earth" was given to students and they could choose any topic based on the main theme. Phase 2 lasted from 26th March 2007 to 30th May 2007 (9 weeks) and the theme given was "The History of Hong Kong and China". WiseNews was introduced to students as a web source that they could use. Four library sessions were offered to students to enhance their information literacy skills including how to use WiseNews. Besides librarian support, IT teacher was responsible for equipping students with IT literacy skills needed for their projects. During IT classes, students learned the use of Chinese handwriting device, Chinese inputting methods and other relevant IT skills for information searching. In addition they had the support of Chinese Language and General studies teachers.

3.1 Sampling

The use of WiseNews by each student was recorded by the Wisers Information Limited. The mode of search (browsing or typing keywords), date and time, document management (viewing, or exporting by email, printing or downloading) were recorded. In phase 1 there were two types of data that were removed. The first type were conducted after midnight and before 7am because the information retrieved were not related to the students' topics; in addition, these were after the normal working hours of Hong Kong Primary students. Hence an assumption was made that these activities were not performed by students. The second type[1] were students (cps4f35[2] and cps4g14) who did 12x more archiving than other students.

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[1] Data from these students are only considered as outliers in section 4.1 and 4.2

[2] To ensure the privacy of students fictitious names are assigned.

4. Findings and analysis

Out of 141 students there were 124 students (87.9%) who used the database in Phase 1, and 28 students (19.9%) in Phase 2. Table 1 is a summary of how information was retrieved in Phase 1 and 2.

Table 1 The way information was retreive in Phase 1 and 2.

	Phase 1		Phase 2	
WiseNews (browsing)	792	18.7%	39	12.9%
WiseSearch (keyword searching)	3442	81.3%	263	87.1%
Total	4234		302	

There are 792 (18.7%) activities done through browsing and 3441 (81.3%) by keywords. In Phase 2, 39 (12.9%) was by browsing and 263 (87.1%) was by keywords. From these results one can conclude that students preferred to use the WiseSearch interface when searching for information. The preference of using keyword searching over browsing is also found in Bila's 2000 and 2002 studies.

4.1 Analysis of Phase 1 & Phase 2 data

Do to the fact that the number of students using WiseNews was different in Phase 1 and Phase 2, the respective data will be analyzed separately. Finally, a comparison between the trends found in Phase 1 and Phase 2 will be discussed.

4.1.1 Phase 1

In order to find out when these activities are being done a graph of the hourly and monthly % activity was plotted (

Figure 1 and **Error! Reference source not found.**, respectively).
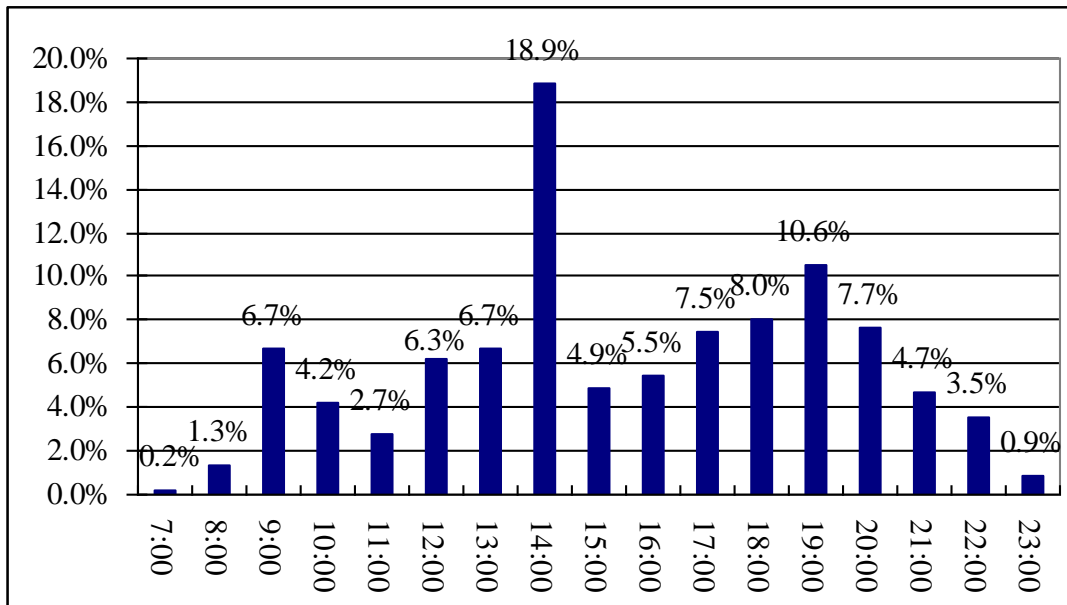
*Figure 1 The % activity in WiseNews each hour in Phase 1[3].*

In

 Figure *1*, there seems to be two trends appearing a distinct peak at 14:00:00-14:59:59 and a peak at 19:00:00-19:59:59. The first peak accounts for 18.9% of the students' activity and it occurs during school hours. This peak may be a result of students' training on how to use WiseNews. A second graph was plotted to remove this effect by only plotting non-class times (

Figure 2).

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[3] There was no activity between 0:00 and 7:00
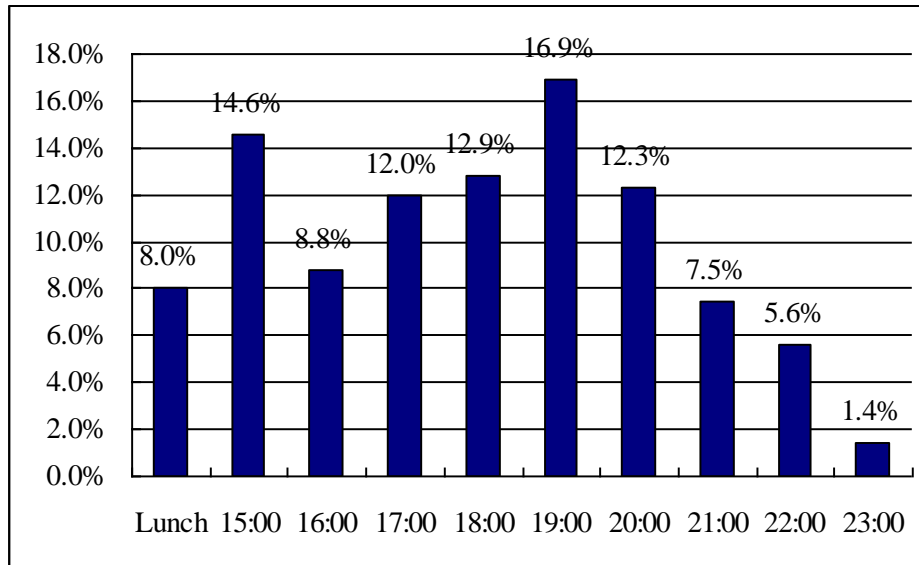
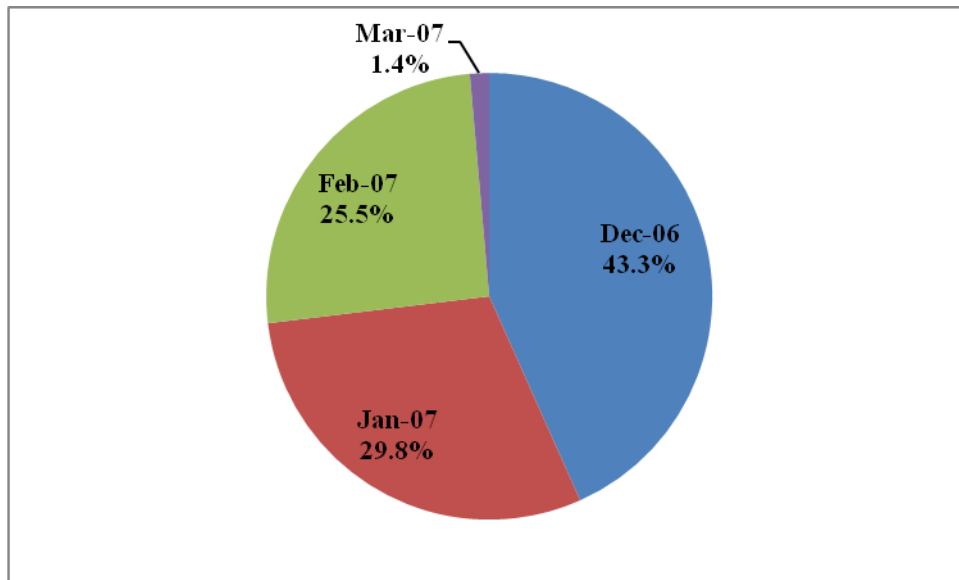*Figure 2 The % activity in using WiseNews during non-school hours.[4]*

In

Figure *2*, two peaks are also found. One is right after school and one between 19:00:00 to 19:59:59. The second peak is same as

Figure 1. Although the first peak describes 16.9% of the activity, it is interesting to note that 14.6% of the non-class hour activity occurs right after school. One can interpret this as students are eager to use the database WiseNews to locate information. Also, some students who have no computer and/or online facilities at home would stay after school (once a week from 1510 to 1630) for computer access in school library.

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[4] Lunch is between 12:30 and 1:30 and the category for 15:00 is for activities between 15:15:00 to 15:59:59 since the students get off of school at 15:15.

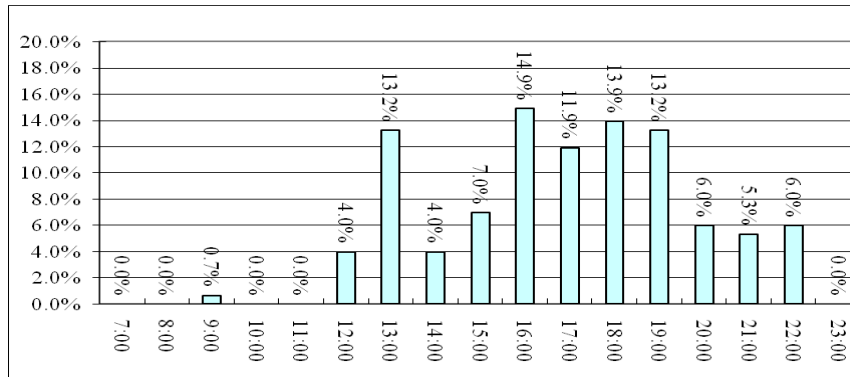*Figure 3 The % activity in using WiseNews each month in Phase 1.*

The majority (63.1%) of the activity was in the first two months (**Error! Reference source not found.**). The trend was as students' projects progress the usage of WiseNews decreased. One assumes that this trend is due to fact that the students would have found majority of their reference material for their project as time progresses.
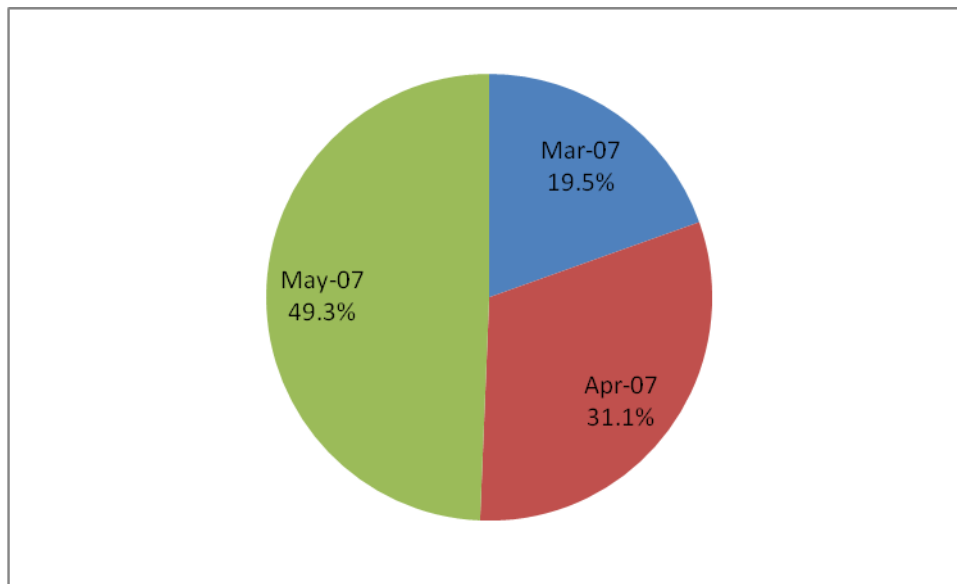
4.1.2 Phase 2

To see if the same pattern would appear in Phase 2 as in Phase 1 a plot of the students' hourly and monthly active was graphed (

Figure *4* and

Figure *5*, respectively)

Figure 4 The % activity in using WiseNews (by Hours) in Phase 2.

Figure 5 The % activity using WiseNews (by Month) in Phase 2.

The trend found in Phase 2 was student did majority of their activity between 13:00–13:59 and 16:00-17:59 (

Figure *4*). In addition, as the project progressed students' monthly activity increased (

Figure *5*). It went from 59 (19.5%) activities in March to 149 (49.3%) activities in May.

4.2   Comparison between Phase 1 and Phase 2

In order to analyze whether or not the trends seen in Phase 1 are seen in Phase 2 a plot of the hourly % activity was plotted (

Figure 6). Then, the habit of using WiseNews during non-school hours, and trend of monthly % through the works of IBL project, were plotted (

Figure 7 &

Figure 8, respectively).
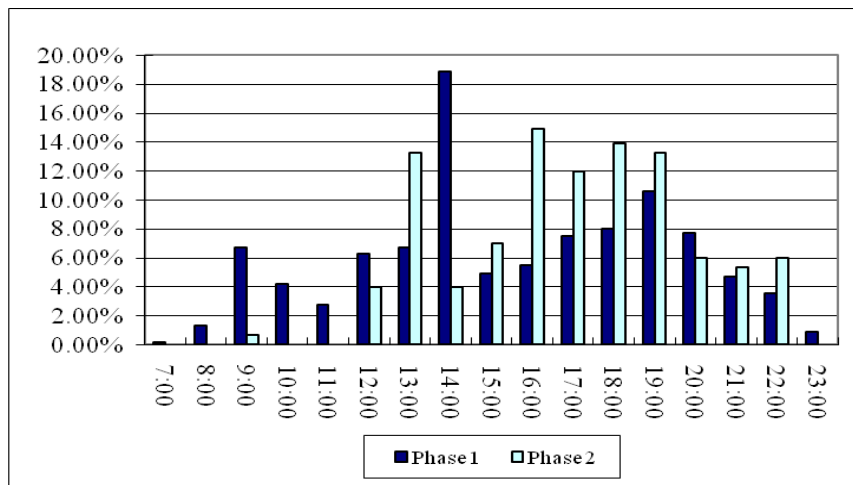
Figure 6 A comparison of the hourly % activity between Phase 1 and Phase 2.

There are several reasons to the large difference between Phase 1 and Phase 2 that are found in

Figure 6. Firstly, there were Christmas and Chinese New Year holidays during Phase 1 and students did searching at home by using WiseNews. Hence, a greater % activity during the school hours was found in Phase 1. Secondly, the training for WiseNews occurred in Phase 1.
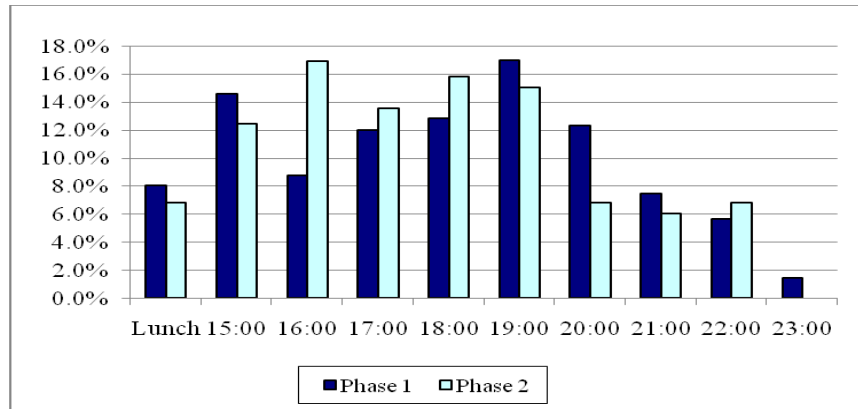
Figure 7 A comparison of the hourly % activity between Phase 1 and Phase 2 during non-class hours[5].

From

Figure *7*, one can observe that the general trend found in Phase 2 matches Phase 1. However the monthly % students' activity there is a difference (

Figure *8*). Although there is a discrepancy, the group quality of projects in both phases were beyond teachers' expectations.

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[5] Lunch is between 12:30 and 1:30 and the category for 15:00 is for activities between 15:15:00 to 15:59:59 since the students get off of school at 15:15.
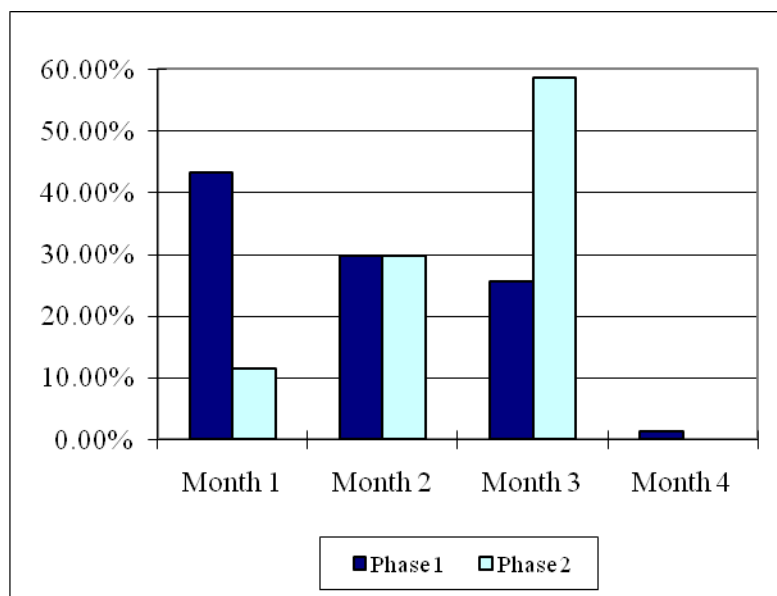
Figure 8 A comparison of monthly % students' activity between Phase 1 and Phase 2.

The discrepancy found in Phase 1 and Phase 2 could be in Phase 2 the project did not start at the beginning of the month but rather at the end of the month due to exams. In addition, because of a limitation of this database students started to panic that they had not found many articles on the topic of "History of Hong Kong and China" near the due date. Hence, the increasing trend found in Phase 2 instead of the decreasing trend in Phase 1.

4.3 Effectiveness of WiseNews in IBL projects

The criteria to measure effectiveness of WiseNews are: the types of information seeking activities performed; and the responses of the teachers' and students' survey on their opinions of WiseNews.

4.3.1 Types of information seeking activities performed by students

A way to measure the effectiveness of WiseNews is to analyze the activity performed. Therefore, an overall overview of student's activity in Phase 1 and Phase 2 was tabulated (Table 2).

Table 2. The overall distribution of students' activity in Phase 1 and 2.

		Phase 1		Phase 2	
Viewed		3953	93.39%	294	97.35%
Archived	**Emailed**	2	0.04	0	0.00%
	Printed	119	2.81	3	.99%
	Downloaded	159	3.76%	5	1.66%
	Total:	4233		302	

According to Table 2 the students did more viewing than archiving[6] in both phases. In Phase 2, there was also more viewing (97.35%) than archiving (2.65%). From this cursory overview the power of WiseNews can be seen. Students are able to view or archive 4514 articles. However, this does not give an in depth look into where or not the use of WiseNews helped students with their projects because a student can do a lot views or downloads in a minute. For example, cps4f35 archived 1542 articles and cpsc4f30 viewed 654 in a minute.

Therefore, a different a way of analyzing the data is required. The likelihood of an article would be increased if the article is both archived and viewed because students' need to first take some to scan the article before decided where or not to archive it. A table was tabulated to look at this distribution (Table 3).

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[6] An article is categorized as archived when it is e-mailed, printed or downloaded.

Table 3. A detail distribution of students' activities.

	Phase 1		Phase 2	
Only Viewed Articles	3844	90.81%	288	95.36%
Only Archived	280	6.61%	2	0.66%
Both Viewed and Archived the same article	109	2.58%	6	1.99%
Max	13		3	
Min	0		0	
Average	0.89		0.21	

A more detailed analysis shows that 2.58% of the activity resulted in both archiving and viewing and article in Phase 1 and 1.99% in Phase2 (Table 3). In Phase 1, 13 articles were located under these conditions and 3 articles in Phase 2.

To show the power of using WiseNews Table 4, and Table 5 were created.

Table 4 A tabulation of the location of the unique sources that were both archived and viewed

Location of Sources	Different Sources	
	Number	**Percentage**
Hong Kong	16	34.8%
China	25	54.3%
Taiwan	4	8.7%
Others	1	2.2%
Total	46	

With the use of WiseNews students were able find source from Hong Kong, Macau, Taiwan, Mainland, and other places in the world (Table 4). When comparing with the students from the previous year teachers made the comment that students stuck local sources.

Table 5. Table showing the top 9 students who view and archive most, total no. of sources used by each of these students and the sources' origins.

USERID	No. of View and Archive	No. of Sources Used	Sources' Regions
cps4f35	24	20	Mainland China, Hong Kong
cps4g14	17	15	Mainland China, Hong Kong, Taiwan, Macau
cps4f17	12	7	Mainland China
cps4e11	11	9	Mainland China, Hong Kong
cps4g26	11	9	Mainland China, Hong Kong
cps4f04	8	6	Mainland China, Hong Kong, Taiwan
cps4f05	6	5	Mainland China, Hong Kong
cps4e36	5	4	Mainland China, Hong Kong, Taiwan
cps4h05	5	4	Mainland China, Hong Kong

It is interesting to note in Table 5 the top two entries were from students that were labeled as outliers in previous calculations and were removed. However, these two students were able to find and use sources from different parts of China which is much different from other students.

Table 6. Table of the articles' subject and their respective source and region for the student that used articles from the four regions.

USERID	Subject of the article	Source (Publication)	Region
cps4g14	Taiwan politics	HK daily news (新報)	Hong Kong
cps4g14	Environmental protection	Apple Daily (蘋果日報)	Hong Kong
cps4g14	Drinking water policy	HK Economic Journal (信報財經新聞)	Hong Kong
cps4g14	Taiwan politics	HK Siong Po (香港商報)	Hong Kong
cps4g14	Road accident	Sing Tao Daily (星島日報)	Hong Kong
cps4g14	Impacts of air pollution	Wen Wei Po (文匯報)	Hong Kong
cps4g14	National science and technology museum	Guang Ming Daily (光明日報)	Mainland China
cps4g14	Issue of share	Stock Times (證券時報)	Mainland China
cps4g14	Wind energy	China Business (中國經營報)	Mainland

			China
cps4g14	Development of wind energy	China Economic Information Network (中國經濟信息網)	Mainland China
cps4g14	National science and technology museum	China Power (中國電力報)	Mainland China
cps4g14	Architecture	Shanghai Evening Post (新聞晚報)	Mainland China
cps4g14	Environmental protection	China Woman (中國婦女報)	Mainland China
cps4g14	Construction accident	Peoples Daily (民眾日報)	Taiwan
cps4g14	Naming of typhoon	Macau Daily (澳門日報)	Macau

Table 6 shows how student, cps4g14, was able to learn from a variety of different topics. This student was able to gather information about politics, environmental protection, pollution, the use of different energy sources, etc.

4.3.2 Survey of Teachers

When asked how WiseNews was used by their students, one of the teachers responded that students used it for extra-curricular use. Another teacher said students used the database for finding information about the current topics that they were learning. Students did searches using the database for other purposes and the use of it was not constrained only for doing the projects.

Teachers acknowledged that WiseNews is a useful tool for students in doing their projects. Teachers held a neutral view towards the difficult level for their students to use the database. One of the teachers expressed that WiseNews contains too much information and students would need help from teachers or parents in order to filter the information that they really needed. It was evident that students found a lot of information in using online databases. Unfortunately they did not know how to evaluate or analyze. Repeated information found is common and students encountered hardships in refining their searches. (Refers to the section 4.2 of the paper *"A study on inquiry-based learning in a primary school through librarian-teacher partnerships"*.)

Teachers responded that the database is useful to them. They commented that WiseNews is a database which is rich of information and could facilitate teaching staff in searching information for teaching. One of the teachers expressed that the database enables students and teachers in acquiring the most updated information for different aspects of subjects.

4.3.3 Survey of Students

Students expressed a neutral opinion to this question whether the database is useful for their projects. There were totally 26 students (18.4%) used the database for other purpose (not just used it for doing project). Twelve of these students said they used the database for reading local news. Eleven of them used the database to search information for their homework or leisure. Three of them did not specify the use.

Table 7. Students' other purposes of using WiseNews

Purposes	No. of Students*
Reading News	12
Information Searching	5
Doing Homework	4
Total:	**21**
* 2 out of 23 responses are not included due to irrelevancy (e.g. User-friendly)	

There is a general agreement among students on the purposes of using WiseNews (Table 7). More than half of them (about 60%) are using it for reading news, and 20% of them treat it as a resort for information searching and use it for their homework. It could thus be deduced that WiseNews is to students an online system that allows the search of e-news of different origins. Therefore, it is worth considering if WiseNews could be incorporated to classroom teaching in facilitating students' learning on different social issues. Moreover, recognizing the significance of WiseNews in being referred to as a useful tool for both leisure news reading and academics, it might be worthwhile for school to introduce students to other online databases or systems. This introduction could encourage a more effective usage of electronic resources among students and facilitate their self-directed learning.

4.4 Limitation of WiseNews

The main theme in Phase 2 is "The History of Hong Kong and China". Students might have found it difficult in seeking appropriate information for their projects in WiseNews because the database is all about current events from 1998 to present rather than documentary or record of historical events.

Students gave an average source of 3.7 out of 5 (1 - hard to use and 5 - easy to use) to the ease of use WiseNews. This reveals that students found that WiseNews is quite easy to use. However, there were 28 students stated the difficulties during their interaction with the database. Nine of them said they had difficulties in the typing Chinese words during searching. Also, they would seek help when they inputted the search terms. This problem could be due to their lack of computer literacy and Chinese word-processing skills. (Refers to the section 4.4.4 of the paper "*A study on inquiry-based learning in a primary school through librarian-teacher partnerships*") Another explanation could be their lack of information literacy skills (Refers to section 4.2 of the paper "*Development of Primary Four students' information literacy and information technology skills*"). In that paper, the research found that students had problem doing advance searching in WiseNews. Students were given a homework sheet that required students do some advance search and the class average was 46.5%. This means majority of the P4 students lack the information literacy skills to take full advantage of WiseNews.

Some of these limitations are also reflected in our survey of the students (Table 8). Sixteen students encountered some of the following difficulties in using WiseNews: could not login, forgot the passwords, could not find the required information, and could not carry out searching.

Table 8 Reasons from students finding WiseNews difficult to use.

Reasons	No. of Students*
Deficient in Chinese Character Input	8
Deficient in Information Searching Ability	7
Limited Sources Variety	3
Total:	**18**

* 3 out of 23 responses are not included due to irrelevancy (e.g. Unable to login)

The two most frequently raised reasons are their deficiency in Chinese Character input and information searching ability (42% for each), with 15% of students thinking that the sources variety is limited. Hence, to facilitate students' usage of useful online database, providing workshops on Chinese word processing and online-search techniques could better equip students with essential IT skills to perform online search, thus allowing students who might be refrained from using it due to their deficient IT skills to share the potential intellectual gains and improved critical thinking and analytical skills associated with the usage of it. These limitations are also found in other online databases (Bilal, 2000; Bilal, 2002).

5. Conclusion and Implications

The researchers found that through the use of WiseNews students were able to find sources from all around the world. This allowed a more comprehensive understanding to be developed, which is what the new General Studies curriculum is trying to achieve. Based on this finding, the EDB should look into a blanket subscription of WiseNews or similar online (news) database (with age-specific searching interface) for all primary schools in Hong Kong can use and reap the benefits of using a web-based information bank for studying.

An interesting finding in this study was very few students performed the activity of both viewing and archiving of an article. This ability might be lacking in majority of P4 students in Hong Kong. Therefore, more training could be provided to help students categorize and manage the information they view. In addition, further studies could look at how educators can provide support in this area.

The researchers also found there are several limitations to the WiseNews database. One is topics that do not related to current events may not reap the benefits of using WiseNews. Another is the interface of WiseNews was designed for adults so P4 students found it difficult to find articles that required advance information searching techniques. To this end two things can be done. First of all, more training can be provided to students so that they would these advance searching

techniques. Second, the interface could be redesigned. Like what was suggested in Bilal's 2000 & 2002 study, Wiser Information Limited (or database service provider) could develop another interface that took into consideration the information seeking behaviours of upper elementary students.

6.   References

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